

**REMARKS**

Claims 7-23, which were withdrawn subject to restriction despite Applicant's traversal, have been canceled without prejudice to Applicant's right to pursue the canceled subject matter in other applications. Claims 24-30 are added. The new claims find support in the specification and claims as originally filed (e.g., paragraphs 37-44 of the specification), and therefore, do not constitute new matter. As such, Claims 1-6 and 24-30 are pending.

Claims 1-6 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over WO 93/12877 in view of U.S. Patent No. 5,352,264 to Medina Vega ("Vega") and U.S. Patent No. 5,830,887 to Kelly ("Kelly").

The Examiner rejects the claims of the present invention as being obvious over a combination of three citations out of which, the primary citation (WO 93/12877) was already cited in the PCT International Search report and the Applicant, during the International stage, had amended the claims and clearly described the distinguishing features between the present invention and the cited document. After considering the amended claims and the arguments submitted by the Applicant, the International Preliminary Examining Authority withdrew the objections and acknowledged the novelty, inventiveness and the industrial applicability of the present invention. It is quite unfortunate that the Examiner has not fairly considered the good report provided by the International Preliminary Examining Authority.

Consequently, the Examiner maintains that, although none of the three cited references teaches the claimed invention, one of ordinary skill in the art would have been motivated to make the proffered combination with a reasonable expectation of success. Applicant respectfully disagrees. The cited references are distinguished singularly and in combination below.

**WO 93/12877 (hereinafter Peter et al.)**

Peter et al. relates to a cross-linked highly porous body having an open-celled, three-dimensional lattice structure which is used as insulating material, fibers, absorbents, ion exchange resins, etc. Peter et al. uses both synthetic and natural polymers as the base material for preparing the cross-linked highly porous body. The Applicant points out that the polymers employed by Peter et al. are essentially gel-forming materials such as proteins. Contrary to the above, the raw materials which are used according to the present invention are not capable of forming gels and are entirely different. Also, as clearly described in Claim 1, the matrix used in the present invention is substantially devoid of proteins. Further, the porous body of Peter et al. is cross-linked with cross-linking agents such as diisocyanates, diacid halides, diepoxides, epichlorohydrin, aldehydes, dialdehydes, trimetaphosphates, vinyl sulfones, urea-formaldehydes and di-halogenated aliphatics. In the present invention, the Applicant specifically teaches a novel metal binding agropolymer which is devoid of any cross-linking agents of metal binding organic nature such as tannic acid or the humic acid. Clearly then, the teachings

of present invention and that Peter et al. are entirely different.

The Applicant also points out that the porous body of Peters et al. is cross-linked with another metal binding agent which is not taught and is not required for the agropolymer of the present invention. The agropolymer of the present invention is novel and distinct as compared to other porous bodies which are linked to metals to remove ions rather than cross-linking with other metal binding agents. The agropolymer of the present invention can be used repeatedly on column mode or batch mode. The invention also teaches cheaper methods for preparation of metal binding substances, which teachings are absent in the cited art.

Applicant addresses Peters et al., the primary reference, independently not – as argued by the Examiner – to show nonobviousness by attacking the references individually (Office Action at p. 7), but to show that one of ordinary skill in the art would have been steered from looking to the teachings of Peters et al., which discloses an entirely different invention from the presently claimed invention, and therefore, would have lacked any motivation to modify its teachings to arrive at the claimed invention. Thus, the Applicant respectfully submits that at least for the above mentioned reasons, the present invention should not be considered as being obvious over Peter et al. either singularly or in combination with the other two cited documents.

U.S. Patent 5,352,264 (hereinafter Vega et al.)

Vega et al. relates to the field of soil conditioners and plant growth regulator which act as fruit filling enhancers and growth regulators. Vega et al. particularly relates to a composition which essentially contain polyhydroxycarboxylic acids, carbohydrates and alcohols which may be obtained from rice and oat hulls. Vega et al. teaches that the aforesaid mixture can act as metal complexing agent. The mixture of polyhydroxycarboxylic acids, carbohydrates and alcohols is treated with metals to form metal complexes and the complexes thus obtained are used as soil conditioning agents, plant growth biostimulants and fertilizer additives. The present invention, on the other hand, relates to a composition comprising only carbohydrates, which is useful for removing heavy metals and other contaminants from water. Thus, the objects of the inventions are entirely different and a person skilled in the art would not refer to Vega et al. to arrive at the present invention.

On page 4, lines 6 and 8 of the Office Action, the Examiner states that "Vega teaches that the carbohydrates of the crop plant parts provide for metal binding reactive sites, since carbohydrates are disclosed to be useful as a metal complexing agent." In support, the Examiner relies upon col.1, lines 45-50 of Vega et al. In this regard, the Applicant respectfully submits that Vega et al. does not teach that carbohydrates can act as metal complexing agents. Vega et al. only teaches that the mixture of polyhydroxycarboxylic acids, carbohydrates and alcohols acts as metal

complexing agent. The Applicant respectfully submits that all the three ingredients taught by Vega et al. are not found in the composition of the present invention and hence, the composition of the present invention is different from that being taught by Vega et al. As the starting material in both the cases have been treated with different processes, the final products obtained are different and also their applications are different.

Thus, the Applicant respectfully submits that at least for the above mentioned reasons, the present invention should not be considered as being obvious over Vega et al. either singularly or in combination with the other two cited documents.

**U.S. Patent 5,830,887 (hereinafter Kelly et al.)**

Kelley et al. describes a composition comprising natural phyto-oestrogens or analogues, which are used as food additives, tablets or capsules for promoting health in cases of cancer, pre-menstrual syndrome, menopause or hypercholesterolaemia. The present invention, on the other hand, relates to a composition which is useful for removing heavy metals and other contaminants from water. Thus, the objects of the inventions are so entirely different that a person skilled in the art at the time of the invention would not have any reason to refer to Vega et al., and even less motivation to combine this reference with the other cited art to arrive at the present invention.

Kelley et al. at Col.9, lines 1-10 defines the treatment of raw hypocotyl and hull material to produce a dry powder or flour to be used as dietary supplement in the form of a powder, in a liquid form, in a granulated form, in a tablet or encapsulated form.

Such description can not be taken into account to judge the novelty of the present case, as the present invention is not dealing with such kind of application.

**Combination of Peter, Vega and Kelly**

As discussed in detail above, each of the separate cited references is directed to entirely different fields. None of the references specifically teach or suggest that carbohydrate and/or silica matrix obtained from seed coats, seed covers, hulls and husks of crops could or should be combined together into a single composition, to obtain an agropolymer composition.

Applicant respectfully submits that the cited references also fail to provide the necessary motivation to have combined the cited references. There is no reason why one of ordinary skill in the art would have been motivated to combine the three citations to practice the claimed invention, at least in view of the fact that the main citation upon which the Examiner relies (Peter et al.) suggests that plant-based materials are not suitable for forming the cross-linked highly porous body. Applicant has pointed out this and other distinctions not, as the Examiner indicates, to read limitations of the specification into the claimed subject matter (*see e.g.*, Office Action at p. 4), but to evidence the fact that the asserted motivation is completely lacking in a reference that teaches away from the invention. The Examiner's dismissal of failures in the art cited within the primary reference (characterized in the Office Action at p. 4 as "some negative testing") is clearly improper, since this intrinsic evidence effectively undermines the

asserted motivation to combine. Accordingly, the Applicant respectfully submits that the claims of the present invention should not be rejected as being obvious over the combined prior art citations.

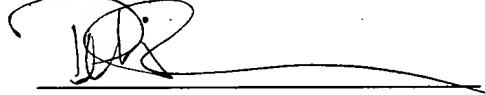
Also, it is essential that the cited documents should inherently point each other and should suggest combining them. In the present case, none of the cited documents suggest that they should be cross-referred. Thus, it is very clear that the Examiner has improperly combined the cited documents merely by hindsight using the advantages taught only in Applicant's disclosure to reconstruct the invention.

Also, it is well established that in order to combine any two documents, the documents should provide a reasonable expectation of success. In the present case, Peter et al. suggest that when plant-based raw materials are used, the success rate is nil. Thus, the documents cited by the Examiner simply fail to establish any reasonable expectation of success. One of ordinary skill in the art, based on the cited references, would not have expected that the asserted combination would be effective for any use, much less for the specific use of the invention. In the absence of any expected advantageous use, one of ordinary skill in the art would lack motivation to make the presently claimed compositions.

**Conclusion**

Applicant respectfully requests reconsideration of the application, and entry of the foregoing remarks into the file history of the above-identified application. Applicant believes that in light of the foregoing remarks, the claims are in condition for allowance, and accordingly, respectfully requests withdrawal of the outstanding rejection. The Examiner is kindly invited to contact the undersigned to arrange an Examiner Interview should one be helpful to advance the prosecution of this application. An allowance is earnestly sought.

Respectfully submitted,



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